

Skywalking GEMS and UDF

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Recently large high resolution space based imaging surveys for galaxies have been conducted with the Hubble Space Telescope and its Advanced Camera for Surveys (ACS). Very prominent are the Hubble Ultra Deep Field (UDF, Beckwith et al., 03/2004), the observations in the GOODS field (Giavalisco et al., 2004) and our own GEMS survey ('Galaxy Evolution from Morphologies and SEDs', Rix et al., 2004), ordered by increasing sky coverage. While the UDF covers one ACS pointing or about $200'' \times 200''$, GEMS covers 70 times as much, nearly $28' \times 28'$. With the observed size and depth of the observations – the UDF is 1–1.5 mag deeper than the Hubble Deep Field – these images are very rich in galaxies of all sizes, shapes, and – all mentioned surveys obtained multi-band images – also colours. The UDF contains almost 10 000 galaxies, GEMS about 40 000.

Both the UDF and GEMS teams created "true colour" images from their data, largely for outreach activity. HST plus its ACS camera have a number of advantages over other instruments, with one combination making it fully unique: the large field-of-view and a $0''.05$ spatial sampling. While this is wonderful for science it poses one problem for outreach applications: How to view these images? The UDF in a computer screen sized resolution shows a number of coloured dots and hides most of the beauty of the very deep space, the GEMS colour mosaic viewed at a resolution of 1000 pixel in width is largely black. We think that the GEMS colour mosaic would be best viewed in a printout about 10 meters on a side (still ~ 6 pixel per mm!), at 50 cm distance to see all details, which might be difficult to realise for a widespread audience. While the underlying amount of image data in JPEG compression is comparably small compared to the science grade images, it is still 10 Mb for UDF and 175 Mb in case of GEMS, thus not very friendly for download without access to institute quality internet.

To nevertheless allow people to enjoy the colour mosaics, we put together a JavaScript web application, that allows to pan around in the 1:1 UDF and 2:1 binned GEMS images via the WWW, without downloading all of the images at once, but only the part viewed. In this way access even with analog modems is possible. We dubbed these applications "GEMS Skywalker" and "UDF Skywalker" (names not sponsored by Lucasfilm). They are available online for free use at

<http://www.aip.de/groups/galaxies/sw/gems/> (GEMS Skywalker)

<http://www.aip.de/groups/galaxies/sw/udf/> (UDF Skywalker).

They should work with most Netscape, Internet Explorer and Opera Versions.

For the realisation of the Skywalkers, we would like to thank both the UDF and GEMS teams for their work that generated these images. Also a big Thank You goes to the developers of the DynAPI JavaScript library (Steinman et al., 2004) that made programming easy.

References

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